and second ends **9577** of the first and second half-nut arms **9567**, **9568** are sufficiently distanced so that the half-nut assembly **9562** fully engages the lead screw **9572**.

[0870] FIG. **126**B shows a perspective, side-view of the syringe pump assembly **9502**. Note the first and second half-nut arms **9567**, **9568**, include internal threads to engage with the lead screw **9572**. A bearing **9573** is coupled to the lead screw **9572** to allow it to rotate. FIG. **126**C shows the plunger head assembly **9516** with the cover of the half-nut assembly **9562** off. Note that a spring **9570** opens the first ends **9577** of the first and half-nut arms **9567**, **9568**, away from the lead screw **9572**. FIG. **126**D shows a perspective angled-view to illustrate how the first ends **9576** of the first and second half-nut arms **9567**, **9568**, engage with the linear cam **9566**. FIG. **126**E shows a side view of the half-nut assembly **9562**. The linear cam **9566** is in a retracted position which occurs when the dial **9505** is in a fully-open position. Note that the rod **9556** is retracted by a spring **9564** (see FIG. **125**B). FIG. **126**F shows the linear cam **9566** is an engagement position. As is viewable in FIG. **126**G, the linear cam's **9566** surface has actuated the first ends **9576** of half-nut arms **9567**, **9568**. When in this position, the linear cam's **9566** surface engages with the first ends **9576** of half-nut arms **9567**, **9568** such if a force was applied to open the first ends **9576** of half-nut arms **9567**, **9568** away from each other, no translation of force will be experienced by the rod **9556**. That is, the linear cam's **9566** surface engages with the first ends **9576** of half-nut arms **9567**, **9568** such that the contacting surfaces are parallel with each other and parallel with an axis of the rod **9556**. FIGS. **126**H and **1261** shows two views where the half-nut assembly **9562** is fully engaged with the lead screw **9572** wherein rotation of the lead screw **9572** linearly actuates the half-nut assembly **9562** (and hence the entire plunger head assembly **9516** relative to the syringe pump assembly **9502**.

[0871] FIG. **127** shows a perspective, side-view of the syringe pump assembly **9601** coupled to a display **9690**. Note the syringe pump assembly **9601** is shown and includes a body **9680**, a syringe seat **9614**, and a plunger head assembly **9616**. The plunger head assembly **9616** includes a plunger head **9681**, a half-nut assembly **9562** (refer to FIG. **114**A), and a plunger tube **9661**. A syringe (e.g., see FIG. **114**E for the syringe **9518**) may be placed into the syringe seat **9614**, which is secured by the retaining member **9604** and a retaining clip **9606**. A dial **9605** opens the pivotal jaw members **9508**, **9510** (refer to FIG. **114**A) and allows the plunger head assembly **9616** to move away from or toward the syringe seat **9614**. The display **9690** includes a screen **9691**, a power button **9692**, an alarm silence button **9693**, and a menu button **9694**. The pump assembly **9601** is configured to show a plurality of displays on the screen **9691** relating to pump operation and patient data.

[0872] FIG. **128** shows a flow chart diagram of a method **9302** for discharging fluid from a syringe and for providing mitigation for an occlusion condition in accordance with an embodiment of the present disclosure. The method **9302** may be implemented by a syringe pump, such as the syringe pump shown in FIG. **127**. The acts may be implemented by or using one or more processors on a syringe pump.

[0873] The method **9302** will be described as being implemented by the syringe pump shown in FIG. **127**; however, such description should not be construed as limiting. The method **9302** may be implemented on any pump that discharges fluid, e.g., any syringe pump described herein. The method **9302** includes acts **9304**-**9316**. Act **9304** loads a syringe into a syringe pump. For example, a syringe may be loaded into the syringe seat **9614**. Act **9306** determines the diameter of a barrel of the syringe. The syringe's barrel diameter may be determined by the position of the retaining finger **9604**. Act **9308** actuates the syringe using the syringe pump. The plunger head assembly **9616** may actuate a plunger of the syringe. Act **9310** estimates fluid pressure within the barrel of the syringe. Act **9312** makes a decision based upon whether the pressure within the barrel of the syringe is below a predetermined threshold? If the decision is yes, then acts **9308**-**9312** may continue to achieve a target flow rate until a target fluid discharged dose is achieved.

[0874] If the decision is no in Act **9312**, in Act **9314**: the syringe pump withdrawals the plunger of the syringe from the barrel of the syringe by a predetermined amount (which may be a distance of actuation or a volume of actuation of the syringe. In Act **9316**, the syringe pump actuates the plunger into the barrel until the fluid pressure within the barrel of the syringe exceeds another predetermined threshold. The one or more processors may sound an alarm or alert notifying a caregiver of the occlusion.

[0875] Various alternatives and modifications can be devised by those skilled in the art without departing from the disclosure. Accordingly, the present disclosure is intended to embrace all such alternatives, modifications and variances. Additionally, while several embodiments of the present disclosure have been shown in the drawings and/or discussed herein, it is not intended that the disclosure be limited thereto, as it is intended that the disclosure be as broad in scope as the art will allow and that the specification be read likewise. Therefore, the above description should not be construed as limiting, but merely as exemplifications of particular embodiments. And, those skilled in the art will envision other modifications within the scope and spirit of the claims appended hereto. Other elements, steps, methods and techniques that are insubstantially different from those described above and/or in the appended claims are also intended to be within the scope of the disclosure.

[0876] The embodiments shown in the drawings are presented only to demonstrate certain examples of the disclosure. And, the drawings described are only illustrative and are non-limiting. In the drawings, for illustrative purposes, the size of some of the elements may be exaggerated and not drawn to a particular scale. Additionally, elements shown within the drawings that have the same numbers may be identical elements or may be similar elements, depending on the context.

[0877] Where the term "comprising" is used in the present description and claims, it does not exclude other elements or steps. Where an indefinite or definite article is used when referring to a singular noun, e.g., "a," "an," or "the," this includes a plural of that noun unless something otherwise is specifically stated. Hence, the term "comprising" should not be interpreted as being restricted to the items listed thereafter; it does not exclude other elements or steps, and so the scope of the expression "a device comprising items A and B" should not be limited to devices consisting only of components A and B. This expression signifies that, with respect to the present disclosure, the only relevant components of the device are A and B.

[0878] Furthermore, the terms "first," "second," "third," and the like, whether used in the description or in the claims, are provided for distinguishing between similar elements